PRODUCTIVITY IN CEMENT INDUSTRY

- A STUDY WITH SPECIAL REFERENCE TO TAMILNADU

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INTRODUCTION

Cement industry is one of the key industries in India. It ranks second immediately after iron and steel industry. The production and consumption of cement to a large extent indicate a country's progress.

Cement is a capital intensive industry which means that competition is limited to mainly small groups of large industrial houses. Cement is a relatively stable product and susceptible to rapid usage declines or obsolescence. It has experienced severe constraints in demand, aggravated by the problem of over capacity. By the end of March 2001 the production was 93.42 million tonnes with an installed capacity of 116 million tonnes. The industry's capacity has grown by eight million tonnes during the year 2001, of which a capacity of 2.80 million tonnes was added in the South.

The word productivity has become a catchword in the industrial field. It is a measure of the economic soundness of the means of production. The economic progress can be achieved by increasing the production coupled with increased productivity. This is amply revealed in the establishment of the National Productivity Council in 1958 and the declaration of 1966 and 1982 to be National

Productivity Years. In fact, a country is said to be economically and industrially backward/forward depending upon the level of productivity of labour, capital and whatever other factors of productions one could conceive of.

Productivity analysis also occupies a central place in the study of wage problems and policies. A rise in wages backed up by a corresponding rise in productivity would contribute to over all gains not only for the economy but for the workers also. But wages/earnings cannot be linked to labour productivity alone without reference to capital productivity and productivity of other factors. If gross margin declines, rate of return on capital falls, provision for reserves goes down, the rate of profit is lowered and ultimately investment is slackened. In this reverse process, the rate of growth of industries begins to fall. Therefore, the study of productivity in cement industry with special reference to Tamil Nadu is necessary to have a better understanding of the phenomenon as well as for delineating the area of remedial action.

STATEMENT OF THE PROBLEM

Productivity is one of the key determinants of cost and price - competitiveness of the cement industry. Transportation and the margin inputs, limestone, coal and power account for 80 per cent of the total cost of sales for cement manufactures. The operating efficiency of the cement industry is judged by

its capacity utilisation and the economical use of major inputs, such as limestone, coal and power consumption per tonne of cement production. The transportation cost is high for inputs accounting for wide variations in the cement prices.

Apart from this, a significant variation in price - volume sensitivity has differential impact on profitability/price realisation of companies. This is more sensitive to change in price than to changes in volume.

The entry of multinational cement companies with strong financial support and significant world-wide capacities result in severe competition.

The measurement of both status and growth rates of productivity has encompassed mainly two issues:- (i) to what extent does productivity contribute to growth, and, (ii) whether growth rates of companies suggest their performance efficiency in various areas.

Further, the investment and its utilisation determine the operational efficiency of the cement companies. In the past, cement industry has set the pace through modernisation for improving efficiency and energy saving by huge investments. By doing so, the company had to face additional production costs. Such issues necessitated an in-depth study on productivity of selected cement companies.

There are so many studies conducted at macro level to deal with the entire economy. Some such studies pertain to a sector or an industry and a very few are the studies at micro level. Hence, to analyse, the productivity in-depth a micro level study is undertaken.

SCOPE OF THE STUDY

The present study, " PRODUCTIVITY IN CEMENT INDUSTRY - A STUDY WITH SPECIAL REFERENCE TO TAMIL NADU" is an attempt to analyse the trends in productivity growth of four selected cements companies, namely, Madras Cements Limited, India Cements Limited, Chettinad Cement Corporation Limited and Tamil Nadu Cements Corporation Limited. The trends in productivity growth is measured by introducing the partial and total factor productivity. It highlights the operating efficiency in terms of productivity by introducing single and multiple factors namely, overall productivity, economic value added productivity, selling, distribution and administration productivity and labour productivity through ratio analysis guided by chartered financial analysts. Also the productivity status is analysed and measured by adopting the eight parameters suggested by Alan Lawlor. Further, the comparisons are made both company-wise and sector-wise (public and private).

OBJECTIVES OF THE STUDY

The main objectives of the study are as follows:

i) To trace the origin and growth of the cement industry.

ii) To study the plants and facilities of the selected cement companies

iii) To evaluate the capacity, production, sales, market share and average price realisation.

iv) To measure the operating efficiency in terms of capacity utilisation and consumption norms.

v) To analyse the productivity status of the selected cement companies.

vi) To analyse the trends in productivity growth of the selected cement companies.

vii) To measure the operating efficiency in terms of productivity and

viii)To offer suggestions to improve the productivity performance of the cement industry..

PERIOD OF STUDY

The present study covers a period of ten years from 1990-91 to 1999-2000.

METHODOLOGY

Sources of Data

The present study is mainly based upon secondary data.

The data sources used in this study are as follows:

1) Cement statistics (various issues) cembureau of Cement Manufactures Association (CMA), New Delhi. 2) CRISIL sector Review, Executive summary of CRISIL Bombay 3) Hand book on Cement and Concrete Roads, The Builders India, Bombay. 4) Data on Cement Industry, The Associated Cement Companies Limited (ACC), Bombay 5) Kothari's Industrial Directory of India, Kothari Enterprises, Madras 6) ICRA Industry Watch Series (various issues) ICRA, Bombay 7) Summary Results for Factory Sector, Annual Survey of Industries (ASI), New Delhi 8) Central Statistical Organisation (various issues) Government of India, New Delhi.

In this study, the details regarding production, sales, materials consumed, total inputs, value added, gross output, capital, fixed assets and all other financial variables are obtained from the annual reports of the respective companies. The actual number of persons employed is gathered from the respective corporate offices of the companies. The whole sale price index of cement has been collected from the Weekly WPI figures from the web-site - http.//www.ceindustry.nic.in.

After extracting the secondary data from the original sources, classification tables were prepared and were taken directly for analysis and interpretation.

Framework of Analysis

1) In order to analyse the productivity status of four selected cement companies, eight parameters are used based on Alan Lawlor's Approach.

2) Single Deflation Method is used to convert nominal value added into real value added in the measurement of output.

3) Production Function Approach is used for analysing the trends in productivity growth, partial productivity and Total Factor Productivity (TFP).

4) Kendrick Index, Solow Index and Translog Index (Divisa Index) are used to measure the overall productive efficiency.

5) The operating efficiency in terms of productivity is measured with the help of the following four areas of productivity namely, Overall Productivity, Economic Value Added (EVA) Productivity, Selling Distribution and Administration Productivity and Labour Productivity.

6) Hartley's F max Test Model has been applied to test the homogeneity of variances in the four areas of productivity.

7) The Annual Growth Rates are computed for the variables such as capacity, production, consumption of cement. The Annual Growth Rates are also computed for partial productivity trends and Total Factor Productivity (TFP) Trends.

Selection of Cement Companies for the Present Study

In Tamil Nadu, there are seven cement companies namely,

1. Madras Cements Limited (MCL)
2. India Cements Limited (ICL)
3. Chettinad Cement Corporation Limited (CCL)
4. Tamil Nadu Cements Corporation Limited (TANCEM)
5. Dharani Cements Limited (DhCL)
6. Dalmia Cements (Bharath) Limited
7. Associated Cement Company Limited (ACC)

Of the seven companies listed above only the first five companies have their registered and corporate offices in Tamil Nadu. The remaining two companies whose registered and corporate offices are located in other states are excluded from the present study. Further, of the five companies whose registered and corporate offices are located in Tamil Nadu, the Dharani Cements Limited is excluded because it has commenced its operation only in 2000. Thus, only four companies namely, Madras Cements Limited, India Cements Limited, Chettinad Cement Corporation Limited and Tamil Nadu Cements Corporation Limited are selected for analysing and evaluating the productivity performance.

CHAPTERISATION

The present study "Productivity in Cement Industry - A Study with Special Reference to Tamil Nadu" has been organised in seven chapters.

The first chapter deals with the "Introduction and Design of the Study" comprising introduction, statement of the problem, scope of the study, review of literature, objectives of the study, period of the study, methodology followed, limitations of the study and the chapter scheme.

The second chapter "The Cement Industry - An Over View", - covers the history and origin of cement manufacturing process and technology, major varieties of cement, cement industry in the world, cement industry in India and cement industry in Tamil Nadu.

The third chapter "The Profile of the Four Selected Cement Companies", highlights the historical background, plants and facilities, production capacity, trends in production, market share, sales, average price realisation, operating efficiency in terms of capacity utilisation and the like.

The fourth chapter analyses "The Productivity Status of Four Selected Cement Companies" both company-wise and sector-wise by using Alan Lawlor's Approach.

The fifth chapter analyses "The Trends in Productivity Growth of the Selected Cement Companies". For this, partial and total factor productivity trends have been arrived at through production function approach.

Chapter the sixth deals with "The Operating Efficiency in terms of Productivity of the Four Selected Cement Companies". Such operating efficiency has been measured with the ratios in the four areas of productivity namely, Economic Value Added Productivity, Overall Productivity, Selling, Distribution and Administration Productivity and Labour Productivity. Further Hartley's F Max test was applied to test the homogeneity of variance and determining whether there is any homogeneity in the multiple and single productivity or not.

The last chapter is summation of the findings and it offers suggestions to improve the productivity performance of the cement industry. The results were furnished as follows:

SUMMARY OF FINDINGS

The second chapter An Overview of the Cement Industry, discusses the origin, processes of manufacturing technology and varieties of cement. This helps to understand the position of the cement industry in the world, the growth and development of the Indian cement industry during the Five-Year Plans, in the period of decontrol and de-licensing in general. The capacity, production and

consumption of cement in India and in Tamil Nadu in particular are also discussed.

Indian cement industry has a planned development during the Five Year Plans. It had a higher growth rate after delicensing of the industry. Between 1990-91 and 1999-2000 the capacity of the industry grew by 7.57 per cent (from 59.12 million tonnes to 108.51 million tonnes).

The production and consumption grew by 8.06 per cent and 7.82 per cent (from 45.76 million tonnes and 45.48 million tonnes to 94.21 and 92.05 million tonnes) per annum, respectively.

As cement industry is location-specific, it has to be necessarily located close to the main raw-material. Consequently, there has been a concentration of cement industry around the sources of lime-stone. In the regional concentration, the southeren region accounts for 33.06 per cent of the total cement industries in India. The state of Andhra Pradesh stands first with 20 factories and Tamil Nadu stands second with 11 factories in the southern region. In terms of capacity (8.82 million tonnes), it occupies the fifth rank among the States in India. Tamil Nadu had witnessed tremendous annual growth rates of 6.01 per cent, 7.26 per cent, and 8.82 per cent of capacity, production and consumption respectively during the study period.

In the third chapter, `A Comparative Analysis of Operating Efficiency', the trends in capacity, production, market share, sales and average price realisation of the four selected cement companies are discussed.

Madras Cements has recorded more than a two-fold increase both in capacity and production. Its market share ranged from 2.4 per cent to 3.1 per cent. There was a three-fold increase in sales value and the average price realisation ranged between Rs.1,493 and Rs.2,595 during the period from 1990-91 to 1999-2000.

The India Cements had 157 per cent increase in capacity and a five-time increase in production. Its market share ranged between 2.5 per cent and 6.6 per cent. The sales volume increased from 1.17 million tonnes to 5.63 million tonnes. India Cements' sales growth was much higher than in other companies. India Cements average price realisation was higher in the country.

The Chettinad Cement's production was more than the capacity. The market share ranged between 1.00 and 1.57 per cent. There was more than a two-fold increase in sales value. The average price realisation ranged from Rs.1,328 per tonne to Rs.2,567 per tonne of cement.

The Tamil Nadu Cements Corporation has not increased either its capacity or its production. This has resulted in a lower percentage of market share. The

average price realisation ranged between Rs.1,536 and Rs.2,111 per tonne. Its trends in capacity, production, market share and average price realisation were the least as compared to other cement companies.

The operating efficiency is measured in terms of capacity utilisation, limestone consumption, coal consumption, power consumption and average price realisation per tonne of cement. The study of operating efficiency of four selected Cement Companies reveals that the Chettinad Cements' capacity utilisation was 131.90 per cent. The India Cements, the Madras Cements, and the Tamil Nadu Cements Corporation had 85.10 per cent 83.50 per cent and 78.70 per cent of capacity utilisation respectively. The Madras Cements and the India Cements had resorted to a low-capacity utilisation in recent years to have control over the sale price of cement.

The limestone consumption per tonne of cement production was found fairly uniform in India Cements, Madras Cements and Chettinad Cement, whereas it was higher by 1.41 times in Tamil Nadu Cements Corporation indicating the least efficiency among the cement companies.

Madras Cements' coal consumption was the lowest at 178 kgs. per tonne of cement production followed by India Cements with 209 kgs. per tonne of cement production which was considered to be more efficient. Chettinad Cement and

Tamil Nadu Cement Corporation had 254 kgs. and 257 kgs. of coal consumption per tonne of cement production. This was considered to be not efficient.

The operating efficiencies of Madras Cements and Chettinad Cement were considered to be good in terms of power consumption as these two companies retained their power consumption at 90 Kwh. and 104 Kwh. As the power consumption of 143 Kwh. in India Cements, and 130 Kw-hour per tonne of cement production in Tamil Nadu Cement Corporation were higher than the standard of 110 Kwh., their operating efficiencies were not satisfactory.

India Cements had the highest average price-realisation of Rs.2,403, followed by Madras Cements with Rs.2,128.50 and Chettinad Cement with Rs.1,999.30. Tamil Nadu Cements Corporation has been considered less efficient with the lower price realisation of Rs.1,859.90 per tonne of cement sales.

As the sector-wise comparison of operating efficiency shows, the performance of private sector cement companies was more outstanding than that of the public sector cement company.

In the fourth chapter, the productivity performance of selected cement companies had been analysed with the help of eight parameters adopted by Alan Lawlor. They are, total earnings to conversion cost, purchased services to total earnings, wages and salaries to sales percentage, profits to conversion cost ratio,

profits to sales percentage, profits per employee, sales per employee and value added per employee. Besides this, 10 years' average productivity ratios and sector-wise comparison of productivity performance have been ascertained.

The ratio of total earnings to conversion cost indicates that there was a consistently good earnings in all the companies except in the Tamil Nadu Cements Corporation. It implies inadequate funds to meet costs. As a result, the output was lower in proportion to their inputs. The sector-wise comparison of total earnings to conversion cost ratio reveals that the earnings in the private sector were consistently good. The purchased services to total earnings ratio indicates the operating efficiency of the company in terms of purchased services cost. The ten years' average of purchased service to total earnings shows that Madras Cements had lower ratio of 0.77 and Tamil Nadu Cements Corporation had higher ratio of 1.01. The performance of Madras Cements was outstanding and had kept its expenditure on purchased services strictly under control. Tamil Nadu Cement Corporation performance was the least and it failed to control the expenditure on purchased services. The sector-wise comparison of purchased services to total earnings show that the private sector ratios were below unity and less than the public sector. It indicates that the purchased services' costs were higher in the public sector.

Wages and salaries as percentage of sales reveals that Madras Cements and Chettinad Cements were spending Rs.4.38 and Rs.4.46 while India Cements and Tamil Nadu Cements Corporation were spending Rs.7.18 and Rs.11.20 for every hundred rupees of sales.

The performance of Madras Cements and was outstanding. Tamil Nadu Cements Corporation had a slackening attitude towards wages and salaries as the ratios had shown a rising trend. Further, the private sector had more control on wages and salaries than the public sector.

Profit to conversion cost ratio is used to determine the relative profitability of the company. It was consistently good in all companies except Tamil Nadu Cements Corporation. Tamil Nadu Cements Corporation's performance was found to be worse resulting in a huge loss. The sector-wise comparison of profit to conversion cost indicates that the private sector is better, reporting good profits.

Profit as a percentage of sales indicates that Madras Cements' profit was high. Tamil Nadu Cements Corporation's profit was found very low. The sector-wise profit to sales indicates the performance in the private sector was better than that in the public sector.

Among the selected cement companies, Madras Cements had good profit per employee at Rs.3.552 lakhs. Tamil Nadu Cements Corporation had low profit

of 0.043 lakhs per employee. Consistently good performance was evident in the private sector, as its overall average profit per employee was Rs.2.311 lakhs.

Sales per employee indicates that the Madras Cements had well performed in generating sales per employee, followed by India Cements and Chettinad Cements. Tamil Nadu Cements Corporation's sales were below unity.

The sector-wise comparison of sales per employee indicates that the public sector was below unity, whereas it was more than unity in the private sector. In the case of value added, Madras Cements had performed well followed by Chettinad Cements and India Cements, their value added per employee being Rs.9.46 lakhs, Rs.7.18 lakhs and Rs.5.62 lakhs respectively. Tamil Nadu Cements Corporation's performance was low as it had only Rs.1.16 lakhs per employee. The sector-wise value added per employee reveals that the public sector had earned less value added.

In the fifth chapter, the trends in productivity growth of the selected cement companies are analysed. The analysis has been segmented into four sections namely measurement of output and inputs, analysis of output and inputs, estimation of partial productivity, capital intensity and total factor productivitiy (TFP) trends. Further, sector-wise (public and private) growth rates have also been computed. Real value added has been taken as a measure of output by using

single deflation method. Capital and labour are considered as the measurement of input. Time series data on real value added as a measure of output reveals that the highest growth rate was obtained in Madras Cements, while the least growth rate was found in Tamil Nadu Cements Corporation. Further, the annual growth rate of the private sector was higher than that of the public sector. The time-series data on labour input indicate that the highest growth rate of 3.95 per cent was found in India Cement, while Tamil Nadu Cements Corporation had a negative growth rate of (-)0.01 per cent. The sector-wise annual growth rate of labour input was found negative in the public sector. This was mainly due to the cost reduction measures. The growth rate of labour input was positive in the private sector. It was due to the capacity additions. Gross fixed capital has been taken as the capital input. The highest growth rate of capital input (28.42%) was found in Madras Cements and the least growth rate of capital input (5.67%) was found in Tamil Nadu Cements Corporation. It implies that there is a scope for introducing the latest production technology in Tamil Nadu Cements Corporation. The highest annual growth rate in capital output (25.70%) was found in the private sector while the least growth rate of capital input was found in the public sector.

Labour productivity, capital productivity and capital intensity have been considered to measure the partial productivity trends. The study reveals that there was a decline in capital productivity. This implies that the capital requirement per

unit of output increased in all the companies and consequently future increase in output would be needed more than proportional increase in capital investment.

Among the four companies, the performance of Madras Cements was the best in the area of (labour and capital intensity) partial productivity. The performance of Tamil Nadu Cements Corporation was the least.

The study observes that the decline in capital productivity with increasing capital intensity in these companies is a matter of great concern, as it is not consistent with the resource endowments of the economy. If these trends were not reversed or checked, they would put a great strain on the economy in the form of lesser demand for man power and greater demand for capital in future.

It also reveals that capital intensity (capital-labour ratio) had increased in all the companies implying that more and more capital could be required for generating employment in these companies.

The sector-wise comparison reveals that the growth of labour productivity and capital intensity were more in the private sector than in the public-sector. The capital intensity was found higher than that in labour productivity and capital productivity in both the sectors.

Total factor productivity (TFP) trends had been measured with the factor productivity index. The ratio of output to a weighted combination of inputs is known as total factor productivity index. It helps to measure the overall efficiency. It is measured with the help of three important indices namely, Kendrick index, Solow index, and Translog index (Divisa index).

Comparison of indices among the selected companies reveals that the Madras Cements Limited had positive growth rates of 8.52 per cent, 8.58 per cent and 8.60 per cent in Kendrick, Solow and Translog indices, respectively. It was a better performer among the four companies. Further, there was a close correspondence among the indices of each company. The sector-wise comparison reveals that the performance of the private sector was better than that of the public sector.

Therefore, declining capital productivity and unwarranted increase in capital intensity had been the main causes of poor performance, that is, decline in overall productive efficiency in Tamil Nadu Cements Corporation, a public sector cement company. The inefficient management, shortage of power and lack of other infra-structure facilities, industrial unrest and the like were responsible for the poor performance but this study has not considered these factors.

Further, in the sixth chapter, the operating efficiency in terms of productivity has been measured with the help of productivity ratios. These productivity ratios have been divided into four areas namely, economic value added (EVA) productivity, overall productivity, selling, distribution and administration productivity and labour productivity. The EVA productivity measures the true productivity by taking into account the total cost of all operating capital. The Madras Cements had an outstanding performance when compared to other three Companies. Further, it indicates that the Madras Cements and the India Cements managed with the capital they had got, whereas the Chettinad Cement and the Tamil Nadu Cements Corporation's operating efficiency was negative, without creating wealth.

The overall productivity indicates that the Madras Cement's performance was outstanding followed by Chettinad Cement and India Cements. The Tamil Nadu Cements Corporation's performance was the lowest among them, indicating low efficiency in utilising the capital employed, fixed assets and working capital. In the area of selling, distribution and administration productivity, the Chettinad Cement's performance was outstanding, as the operating expenses were relatively low. In other words, its efficiency was high in utilising the operating expenses. Tamil Nadu Cements Corporation's performance was the poorest on account of high salary expenses, distribution expenses,

travelling expenses and other related expenses. The labour productivity indicates that the Madras Cements performance was outstanding followed by India Cements and Chettinad Cement. Tamil Nadu Cements Corporation's performance was the least. It indicates that the operating efficiency was low due to inefficient workers, much idle time, abnormal wastage and high production cost. The sector-wise comparison reveals that the private sector cement companies' performance was better than that of public sector cement company in all the areas of productivity. Finally, in this chapter, Hartley's Fmax Test Model has been applied to determine whether the four areas of productivity had any difference or not. By using a level of significance of $\alpha = 0.05$, differences were found in variances of four groups, both company-wise and sector-wise.

SUGGESTIONS

The following are the suggestions based on the analysis of productivity in the cement industry.

Production Technology

i) Precalciner System

In the production process, all the cement factories are not using the precalciner system. The latest precalciner system should be introduced in all factories. In this system raw-material is precalcined to a degree of 80 per cent to

95 per cent, before entering into the kiln by a secondary furnace. This reduces the thermal load of the kiln, consequently the kiln size and its associated investments. It increases the life of the kiln by 50 per cent and reduces the maintenance cost of kiln.

ii) Vertical Roller Mill

The energy saving can be achieved by installing vertical roller mill instead of ball mill. It can save as much as 30 per cent power and can also increase the productivity by 60 per cent with efficient separators. It is economical in respect of initial investment on buildings as well as running costs.

iii) X-ray spectrometer

To ensure better and specified quality of raw-material mixture in the production process, the use of computer-operated x-ray spectrometer is recommended.

iv) Flexible Manufacturing System

Every business faces competition in the face of globalisation. The cement industries are forced to increase their levels of productivity so as to fix the price and services competitively. Computer-assisted manufacturing can change the labour intensive techniques. At the same time, it would store and supply the data

required for production and quality control. It helps managers to make better decisions and to eliminate non-value added costs.

v) Activity Based Costing System (ABC)

Activity-based costing system is the collection of financial operation performance information, tracing the significant activities of the firms to reduce cost. It concentrates on activities which could be summed up as compiling the cost of products and more accurate picture of costs, their relationship behaviour, thus identifying opportunities for cost reduction through proper planning, control, process and product improvement. The result for the system can better identify the relationship between the causes (activities) and the effects (costs) in a more detailed and accurate manner. It also makes it possible to compare and combine the cost inter-related activities in various departments. Unnecessary costs can also be identified and reduced. It measures and tracks the costs of significant activities over time. It attempts to assign the costs of significant activities to the products that cause those costs to be incurred. Therefore, the activity-based costing system can help the management to have better cost control and reduce unnecessary costs of production.

vi) Transportation

Cement is highly freight-intensive in nature. The industry faces serious transportation constraints in terms of timely-available rail wagons. This has forced manufacturers to move progressively larger quantities by road. But road transportation is expensive. In order to reduce the manufacturing costs and distribution costs, the companies should utilise the 'own your wagon' (OYW) and 'Build Operate Lease Transfer' (BOLT) schemes of railways. Under these schemes, the companies have to procure the wagons and lease the same to the railways and in turn the railways will give priority in allotment of wagons.

vii) Human Resource Development

Among all the required resources of the industry, human resource plays a vital role. Productivity of an industry can be effectively achieved through human resource development. The following suggestions are offered for human resource development.

i) Management should build a strong relationship with the employees by carefully studying the individual's behaviour, ideas, attitude and expectations.

ii) Management should acknowledge employee's outstanding performance through public recognition with reward.

iii) Management should administer fair treatment to subordinates alike and also acknowledge the differences between mediocre employees and outstanding employees for better motivation.

viii) Green Productivity

The cement industry, by the very nature of its raw materials and production process, faces the problem of polluted environment. The cement industry should develop total green productivity. All the cement plants have to plan their layouts with green lawns, plantation, rose, gardens, lake views, fountains and the like to create better environment for productivity improvement.

ix) Blended Cement

The cement industry should arrange for the promotion of blended cement in the country through vociferous campaign at different levels including live projects for demonstration. Consumers have to be encouraged to use blended cement which produces more durable concrete, conserves limestone reserves, consumes less energy and releases less CO_2 to the atmosphere during manufacturing.

x) Taxation

The domestic price includes a large element of taxation and duties which account for 60 per cent of the bare production cost or 25-30 per cent of the sale

price. The Government should take steps to reduce the present excise duty of 25 per cent on cement.

The Government should bring down the present customs duty of 30 per cent on coal to five per cent as in the case of the cooking coal.

xi) Price

The Government should recommend the price norms for different cement markets in the country.

The fair ex-stockist price should be computed by the Government and it should be the average cost of delivering cement including taxes and cost of production from the respective areas, to determine the fair price at market.

xii) Suggestions to Tamil Nadu Cements Corporation Limited, Public Sector

In addition to the above suggestions in general, a spate of suggestions are made to Tamil Nadu Cements Corporation in particular.

1. Replacement of old wet process production technology by the establishment of million tonne capacity cement plant with precalciner system is suggested to improve the production level, market share and price realisation.

2. In order to improve the operating efficiency in terms of limestone consumption, only cement grade limestone should be used in manufacturing cement. Further production of certain varieties namely Portland, Pozzolana Cement (PPC) and Portland Blast Furnace Slag Cement (PBFSC) should be increased as they consume less limestone during their production process. Resultantly savings can be effected in the consumption cost of limestone.

3. Inadequate funds to meet the cost resulted in low earnings to conversion cost. The managements have to mobilise the adequate funds to meet the cost. By doing so it can increase the production and thereby improve the earnings.

4. Of various purchased services, repairs and maintenance, packing charges and cost of raw materials are amenable to control by cement units. In this context, the principles of Activity-Based Costing (ABC) system as aforesaid, will be of much use in controlling the cost of purchased services.

5. The employment of labour force is excessive when compared to production. As a result, TANCEM spends Rs.11.20 as wages and salaries for every hundred rupees of sales, which is higher than what the

private sector companies pay. To reduce the higher labour costs and to increase the productivity levels, the management can implement the system of voluntary retirement scheme.

6. Factory overheads have to be reduced in order to minimise the conversion cost of 0.09 paise in every rupee of total cost incurred.

7. As operating cost is higher, it should be controlled to earn substantial profit.

8. The management should take necessary steps to change the attitude of the employees towards corporate goals of sales and profit.

9. Steps should be taken to reduce the cost of bought-out materials, thereby value added per employee can be improved.

10. By adopting systematic and efficient purchase procedures the input cost can be reduced. Further sales promotion techniques can be stepped up to sell the cement at a premium price.

11. Management has to take necessary steps to mobilise more capital. Labour productivity and capital intensity can be improved by investing the required capital in infrastructure facilities.

12. The cost of all operating capital should be reduced, so that it can improve the EVA productivity and thereby create wealth.

13. Steps should be taken for better utilisation of both fixed and working capital. Fixed capital is sunk in the form of obsolete machinery. It is to be replaced with sophisticated machinery. Moreover, in the area of working capital, the size of stores and supplies must be ideal.

14. The management has to take effective steps to reduce the selling, distribution and administration costs so as to attain higher productivity in selling, distribution and administration.

15. Management should identify and take necessary steps to retrench the inefficient workers to attain higher labour productivity.

xiii) Scope for further Research

This study in its usual course, offers scope for further research in the following areas:

1. Production function analysis of both regional and national level.
2. Cost function analysis.
3. Quality-productivity relationship using a production simulation game.
4. Green productivity in the cement industry.

CONCLUSION

For the Indian cement industry, many challenges lie ahead. Increase in productivity is imperative in order to raise the standards of living and also to make the Indian exports globally competitive. Cement industry will have to devise strategies for economising the use of inputs and curtailing costs so as to remain competitive in the global trading environment.